
SECTION ONE - ENVIRONMENTAL REGULATIONS

CHAPTER 1: Air Quality Regulations

Introduction

The lithographic printing industry operates processes that emit air contaminants. Printing presses, photographic film processors and cleaning operations all have the potential to emit air contaminants. Although these processes may not directly discharge contaminants to the outer air, they do release air contaminants that eventually escape the building and enter the atmosphere.

The indirect or direct release of these air contaminants into the outer air is regulated under federal and state rules. The purpose of these requirements is to minimize the adverse impact the air contaminants have on human health and the environment. The U.S. Environmental Protection Agency (EPA) has the responsibility of developing new regulations that implement mandates of the federal ***Clean Air Act Amendments of 1990***. Federal air quality regulations are published under ***Title 40, Parts 50 through 99*** of the ***Code of Federal Regulations (40 CFR Parts 50-99)***.

Part 55 of the ***Natural Resources and Environmental Protection Act, Public Act 451 of 1994, as amended, (Act 451)*** is the state law that regulates sources of air contaminants. The first administrative rules promulgated under ***Part 55 of Act 451***, the ***Michigan Administrative Rules for Air Pollution Control***, became effective on August 15, 1967. The Air Quality Division (AQD) of the Michigan Department of Environmental Quality (MDEQ) is responsible for developing and implementing state air quality requirements and enforcing compliance with both state and federal air quality requirements.

Historically, commercial and industrial sources of air pollution located in Wayne County have been regulated by the county government. On October 1, 2001, the county ceased operation of the air program; and the AQD now administers the program in Wayne County.

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Currently there are no air quality state rules or federal regulations specific to lithographic printers. Some lithographic printers, however, may be subject to one or both of the air quality permitting programs. The focus of this chapter is on determining applicability of Michigan's Permit to Install and Renewable Operating Permit programs to lithographic printing operations. The process of

determining whether or not permits are required involves the calculation of actual and potential emissions of air contaminants.

1.1 Air Emission Calculations

It is important to calculate the air emissions generated from your facility to determine whether or not your facility needs any permits. There are several exemptions to the air quality permitting programs based on actual and/or potential emissions. This section describes the difference between actual and potential emissions, explains how to perform emission calculations, and provides example calculations.

1.1.1 Air Contaminants

Before we can calculate air emissions, it is important to know what types of substances are considered air contaminants. For lithographic printing operations, the majority of air contaminants are found in inks, fountain solutions, and cleaning solvents.

There are many defined groups, or families, of air contaminants. The first family of air contaminants that lithographic printers should be aware of is the *criteria air pollutant family*. This is a very well known family, but it is quite small with only the following six members:

- carbon monoxide (CO);
- lead (Pb);
- nitrogen dioxide (NO₂);
- ozone
- particulate matter (PM); and
- sulfur dioxide (SO₂).

Criteria pollutants were the first set of pollutants recognized by EPA as needing standards on a national level. EPA set National Ambient Air Quality Standards for criteria pollutants since they are known to be dangerous to human health and the environment at certain concentrations. If the measured concentration of any criteria air contaminant exceeds the National Ambient Air Quality Standard, then that area is designated as nonattainment for that criteria air contaminant. If the measured concentration is below the standard, the region is designated as attainment.

Ozone is a criteria air contaminant, however, most facilities do not emit ozone directly. Many facilities do emit volatile organic compounds (VOCs) and nitrogen oxides (NO_x) that create ozone in the presence of sunlight. Therefore, VOCs and NO_x are called ozone precursors.

Another important family of air contaminants is VOCs which was just mentioned as a precursor to ozone. A VOC is any compound that contains carbon and participates in the formation of ground level ozone (smog). Many compounds are VOCs so there is no definitive list. Common VOCs emitted from printers include:

- isopropyl alcohol;
- methyl ethyl ketone;
- methyl isobutyl ketone;

- mineral spirits;
- naphthas;
- stoddard spirits;
- toluene; and
- xylene.

Hazardous air pollutants (HAPs) are another family of air contaminants. HAPs, which are also referred to as air toxics, cause serious illness and environmental damage at certain concentrations. The **1990 Clean Air Act Amendments** list the 188 hazardous air pollutants. A list of HAPs is provided at the end of this chapter.

Many air contaminants belong to more than one family. Most of the HAPs are also considered VOCs. For example, xylene is a VOC and it is also one of the 188 HAPs.

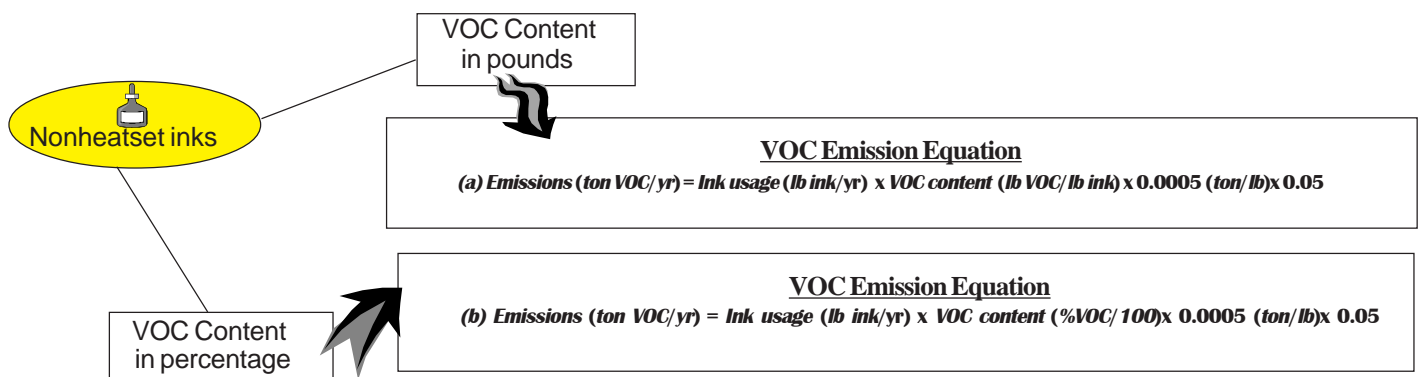
1.1.2 Calculating Actual Emissions

Actual emissions are the amount of air contaminants that are released into the atmosphere. This section contains equations that printers can use to calculate their actual emissions based on material usage. There are specific equations for inks and general equations for other materials such as fountain solutions and cleaning solvents. Before calculating emissions, subtract the amount of materials that have been removed by licensed waste disposers or recyclers. If the materials have been recovered and reused in-house, they cannot be subtracted. To determine the total annual emissions from the facility, add together the emissions from all the inks and other materials. (Although the equations are for VOC emissions, they can also be used to determine HAP emissions by substituting the VOC content with the HAP content.)

1.1.2.a Inks

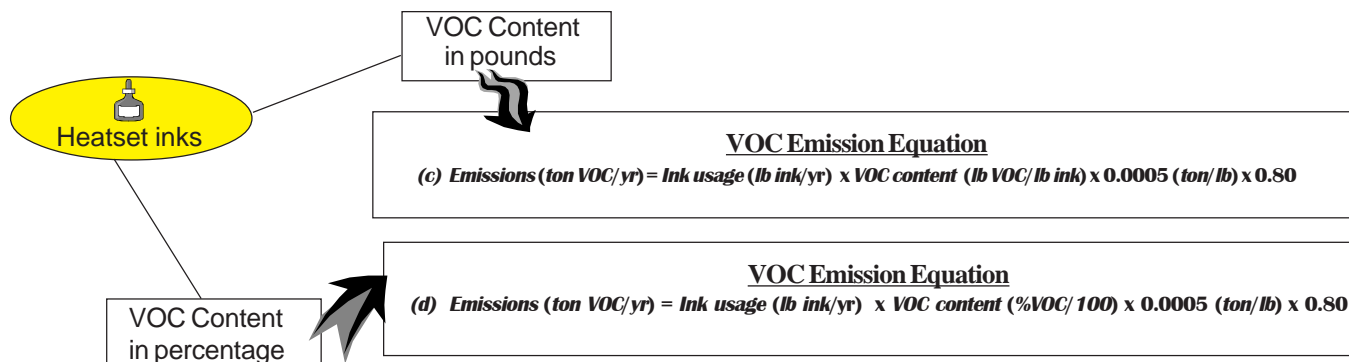
The equation to use for calculating the VOC emissions from inks depends on whether it is a heatset or a nonheatset ink, and whether the VOC content is given in pounds of VOC per pound of ink or as a percentage by weight. *Make separate calculations for each ink.*

For nonheatset inks, use equation (a) below if the VOC content is given in pounds of VOC per pound of ink, and equation (b) if the VOC content is given as a percentage by weight. Equations (a) and (b) account for the 95 percent VOC retention in the substrate.



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For heatset inks, use equation (c) if the VOC content is given in pounds of VOC per pound of ink, and equation (d) if the VOC content is given as a weight percentage. Equations (c) and (d) account for the 20 percent VOC retention in the substrate.



Example 1:

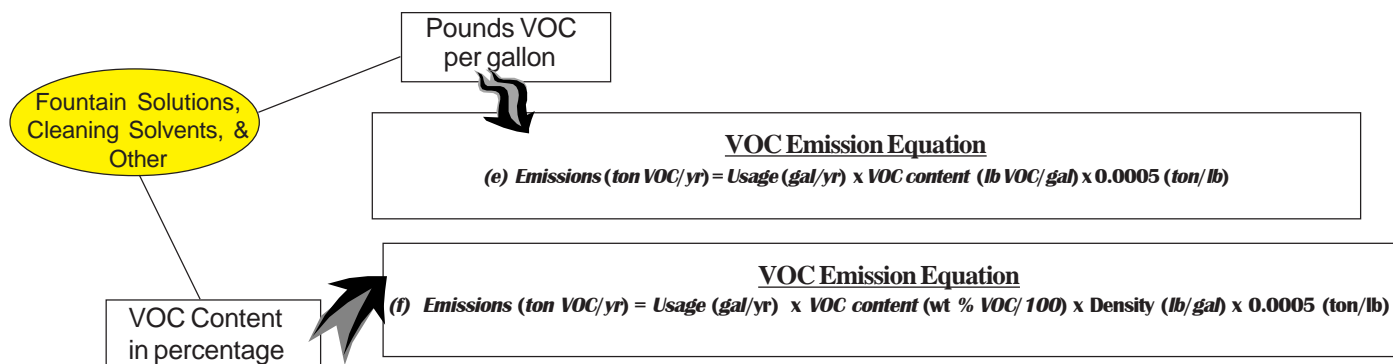
A lithographic printer uses 6,000 pounds of a nonheatset ink with a VOC content of 20 percent by weight. What are the VOC emissions from that ink in tons per year?

Since it is a nonheatset ink, we have to use either equation (a) or (b). The VOC content is given as a weight percentage, so equation (b) will be used.

$$6,000 \text{ lb ink/yr} \times (20\% \text{ VOC}/100) \times 0.0005 \text{ ton/lb} \times 0.05 = 0.03 \text{ tons VOC/yr}$$

1.1.2.b Fountain Solutions, Cleaning Solvents, and Other Materials

To calculate the emissions from fountain solutions, cleaning solvents and other materials use equation (e) below if the VOC content is given in pounds of VOC per gallon, and use equation (f) if the VOC content is provided as a weight percentage.



Example 2:

A lithographic printer uses 500 pounds of a blanket wash solvent with a VOC content of 6.74 pounds VOC per gallon. What are the VOC emissions from that solvent in tons per year?

Use equation (e) since the VOC content is given in pounds of VOC per gallon.

$$500 \text{ gal/yr} \times 6.74 \text{ lb VOC/gal} \times 0.0005 \text{ ton/lb} = 1.69 \text{ tons VOC/yr.}$$

1.1.3 Calculating Potential to Emit

Potential to emit is the maximum amount of air contaminants that a printer could possibly emit if:

- each process operates at 100 percent of its design capacity;
- each process operates 24 hours per day, 365 days per year;
- materials that emit the most air contaminants are used 100 percent of the time; and
- air pollution control equipment is turned off.

Process bottlenecks, permit conditions, state and federal air quality rules, and compliance and enforcement documents legally restrict the capacity of a facility to emit an air contaminant, and consequently, can be used to reduce the potential to emit.

Although calculating potential to emit can be difficult, there is a simple way for lithographic printers to get an approximate value. This approximation is derived by converting your actual emissions to emissions that would be generated if you operated continuously. To use this approach, multiply your actual emissions (as determined in Chapter 1.1.2) by:

8,760 hours per year and divide by the number of hours your plant operated for the year.

This calculation will not give you your true potential to emit since it does not assume that your worst materials are being used continuously and it may not reflect full operating capacity. For information on how to perform a more detailed potential to emit calculation, contact the Clean Air Assistance Program at 800-662-9278.

Example 3:

A lithographic printer operated 2,080 hours last year and generated 2.94 tons of VOC emissions. What is the printer's approximate potential to emit?

$$2.94 \text{ ton VOC/yr} \times [(8760 \text{ hr/yr}) / (2080 \text{ actual hrs/yr})] = 12.4 \text{ tons/yr VOC.}$$

Notice that the potential to emit (12.4 tons per year) is much higher than the actual emissions (2.94 tons per year).

1.1.4 Case Study

XYZ Printers would like to calculate its actual emissions and its potential to emit. They operate 2,080 hours per year (8 hours per day, 5 days per week, 52 weeks per year). The following information was gathered from usage records and material safety data sheets (MSDS):

Material	Usage	VOC content	HAP content	Density
Brand A ink(nonheatset)	1800 lb/yr	20% by weight	NA	NA
Brand B ink(nonheatset)	6000 lb/yr	20% by weight	NA	NA
Blanket wash solvent	500 gal/yr	6.74 lb VOC/gal	1.6% Xylene by weight	6.67 lb/gal
Isopropyl alcohol	300 gal/yr	6.54 lb VOC/gal	NA	NA
Alcohol replacement	40 gal/yr	7.14 lb VOC/gal	90% Glycol ether by wt.	7.56 lb/gal
Fountain concentrate	200 gal/yr	0.88 lb VOC/gal	3% Glycol ether by wt.	9.16 lb/gal

A VOC Emission Calculation Sheet and a HAP Emission Calculation Sheet were used to help XYZ Printers perform their calculations. These completed forms, along with blank copies of the forms, are at the end of this chapter. Using these forms, the actual VOC emissions from XYZ Printers were determined to be 2.94 tons per year and the VOC potential to emit was determined to be 12.38 tons per year. The total HAP emission is 0.20 tons per year; and the HAP potential to emit is 0.85 tons per year.

1.2 Air Quality Permits

There are two differing yet related air permit programs of which owners of lithographic printing operations should be aware:

- the Permit to Install program; and
- the Title V Renewable Operating Permit program.

Both programs are administered by the AQD of the MDEQ.

1.2.1 Permit to Install Program

According to **Rule 201** of the *Michigan Administrative Rules for Air Pollution Control*, before a facility can legally install, relocate, modify or reconstruct equipment that emits air contaminants, it must apply for and receive an approved Permit to Install. Each Permit to Install contains a list of general and special conditions. These conditions typically:

- limit the emission of air contaminants;
- restrict hours of operation;
- limit the amount and type of raw materials used; and/or
- require the operation of air pollution control devices.

The permit conditions limit the facility's potential to emit. The procedure involved in the issuance of a Permit to Install is called New Source Review. Examples of processes at a lithographic printing facility that emit air contaminants include printing presses, dust collectors, degreasers and heating units.

1.2.2 Permit to Install Exemptions

Michigan Rules 279-290 list several processes that are exempt from the requirement to obtain a Permit to Install. Common exemptions that lithographic printers may take advantage of include the following:

- **Rule 280(c)**: Natural draft hoods or natural draft ventilation not designed or used to remove air contaminants generated by, or released from, specific units of equipment.
- **Rule 281(h)**: Cold cleaners that have an air/vapor interface of not more than 10 square feet.

- **Rule 282(b)(i):** Fuel-burning equipment which is used for space heating, service water heating, electric power generation, oil and gas production or processing, or indirect heating and which burns only . . . Sweet natural gas, synthetic gas, liquefied petroleum gas, or a combination thereof and the equipment has a rated heat input capacity of not more than 50,000,000 BTUs per hour.
- **Rule 285(f):** Installation or construction of air pollution control equipment for an existing process or process equipment provided that the control equipment itself does not actually generate a significant amount of criteria air contaminants as defined in **Rule 119(e)** or a meaningful quantity of toxic air contaminants.
- **Rule 285(l)(vii):** Photographic process equipment by which an image is reproduced upon material sensitized to radiant energy, including . . . (D) Photographic developing processes.
- **Rule 290:** **Rule 290** exempts emission units with limited emission from having to obtain a Permit to Install. Emission units that emit small quantities of various categories of air pollutants are good candidates for this exemption. Therefore, lithographic printing presses are good candidates.

What is an emission unit? An emission unit is an activity or equipment that emits air contaminants. It consists of one or more process devices, zero or more control devices and zero or more stack devices. A process device is the activity or equipment that emits the air contaminant. A control device is the equipment that captures and/or destroys the air contaminant and the stack device is the conduit for the air contaminants. For an emission unit to contain two or more process devices there must be some dependency between them. In the lithographic printing industry, each press is considered an emission unit.

Three criteria must be met to use the **Rule 290** exemption:

1. The emissions from the emission unit(s) must not meet any of the criteria in **Rule 278**. If the total emissions from your project exceed the thresholds contained in **Rule 278**, none of the permit exemptions, including **Rule 290** can be used. The VOC threshold that cannot be exceeded according to **Rule 278** is 40 tons per year. If you are installing multiple emission units during the same timeframe, you may exceed the emission thresholds in **Rule 278**. Contact the Clean Air Assistance Program for help (800-662-9278).
2. The emission of any toxic air contaminant, excluding noncarcinogenic VOCs and noncarcinogenic, non-ozone forming compounds listed in **Rule 122(f)**, must have an Initial Threshold Screening Level (ITSL) or Initial Risk Screening Level (IRSL) equal to or greater than 0.04 ug/m³. A toxic air contaminant is defined in **Michigan Rule 120(f)** as any air contaminant for which there is no national ambient air quality standard and which is or may become harmful to public health or the environment when present in the outdoor atmosphere in sufficient quantities and duration. **Rule 120(f)** lists 40 substances that are not considered toxic air contaminants. Inks, fountain solutions and/or cleanup solvents may contain chemicals that are considered toxic air contaminants.

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What is an ITSL and IRSL? A screening level is a concentration of an air contaminant that, if exceeded at the property line of facility, could result in adverse effects to human health and the environment. The AQD does not allow companies to emit air contaminants in quantities that will exceed the screening levels at the property line. ITSLs are screening levels for noncarcinogenic air contaminants and IRSLs are screening levels for carcinogens. Screening levels are expressed in concentrations of ug/m^3 , are developed from toxicological data, and are expressed in various averaging times, i.e., one-hour, eight-hour, 24-hour, and annual.

If a chemical has no ITSL, or its value is 0 then it means the ITSL has not been established and either the company or the AQD will have to develop one. If there is no good toxicological data for the toxic air contaminant, the AQD uses a default value of $0.10 \text{ ug}/\text{m}^3$ annual/averaging. There is not a default screening level for carcinogenic toxic air contaminants.

You can obtain a list of the screening levels by contacting the AQD directly (see Appendix C) or by accessing the MDEQ's web site. Go to www.michigan.gov/deq and click on "Air," "Air Toxics," and then "Screening Levels."

3. The actual monthly emissions of air contaminants from each emission unit must not exceed any of the emission thresholds identified in **Rule 290**. There are thresholds established for certain categories of air contaminants as well as a threshold for total emissions from the emission unit (see Table 1).

Table 1. Rule 290 Summary

Category	Requirements
1. Noncarcinogenic VOCs and noncarcinogenic, non-ozone forming materials listed in Rule 122(f) OR Noncarcinogenic air contaminants with ITSL $\geq 2.0 \text{ ug}/\text{m}^3$	A. Controlled emission ≤ 500 pounds/month OR B. Uncontrolled emission $\leq 1,000$ pounds/month
2. Noncarcinogenic air contaminants with $2.0 \text{ ug}/\text{m}^3 > \text{ITSL} \geq 0.04 \text{ ug}/\text{m}^3$ OR Carcinogenic air contaminants with IRSL $\geq 0.04 \text{ ug}/\text{m}^3$	A. Controlled emission ≤ 10 pounds/month OR B. Uncontrolled emission ≤ 20 pounds/month
3. Particulate with ITSL $> 2.0 \text{ ug}/\text{m}^3$	All of the following: 1. Require a baghouse or equivalent control 2. 0.01 pound particulate/1,000 pound exhaust gas 3. Exhaust gas flow $\leq 30,000$ cfm 4. Opacity $\leq 5\%$
NOTE: <ul style="list-style-type: none">• Particulate may be considered as an air contaminant under category 1 or 2, or independently under category 3. However, if they are considered under category 1 or 2, Part 3 rules apply.• Total emissions from categories 1 and 2 may not exceed 500 pounds/month for controlled emissions or 1,000 pounds/month for uncontrolled emissions.• Process may not emit noncarcinogenic air contaminants (excluding noncarcinogenic VOCs) with an ITSL $< 0.04 \text{ ug}/\text{m}^3$.• Process may not emit carcinogenic air contaminants with an IRSL $< 0.04 \text{ ug}/\text{m}^3$.	

To comply with **Rule 290**, the facility must identify the emission unit covered by the exemption, and keep monthly records to verify compliance with the appropriate emission threshold. The Clean Air Assistance Program has developed a recordkeeping form a source can use to track its monthly emissions and consequently verify its compliance with the **Rule 290**. There is a blank “Rule 290 Permit to Install Exemption: Sources With Limited Emissions Record” at the end of this chapter.

Using Rule 290 can be very difficult. A simplified **Rule 290** recordkeeping form entitled “Permit to Install Exemption Record for Lithographic Printers,” however, has been developed for this industry since most lithographic printers only emit noncarcinogenic VOCs. This simplified form uses assumptions from the US EPA *Control Techniques Guidelines for Offset Lithographic Printing* to provide an easy monthly VOC emission calculation. The following information is required for each press:

- a brief description;
- the press width;
- the number of blankets; and
- the monthly operating hours.

The simplified **Rule 290** form is only a guide to determine whether or not your presses are exempt. If your emissions are close to the 1,000 pounds per month level, you should perform more detailed calculations using source specific information. At the end of this section there is a blank simplified **Rule 290** form along with a sample completed form.

If any of your presses cannot meet the 1,000 pounds per month limit, you may be required to apply for a Permit to Install. Contact the Clean Air Assistance Program or the AQD for a permit application.

1.2.3 Title V Renewable Operating Permit Program

The Renewable Operating Permit program is required by **Title V of the 1990 Clean Air Act Amendments**. This program is intended to clarify a facility’s air requirements by consolidating all state and federal air quality requirements into one document. The Renewable Operating Permit will not add any new requirements, more stringent emission limits, or greater control; however, many facilities will have to establish new monitoring systems to demonstrate compliance with emission limits and material usage limits.

A renewable operating permit is valid for five years, then it must be renewed.

Most lithographic printers are not subject to the Renewable Operating Permit program. Only major sources are required to apply for a Renewable Operating Permit. A major source has the potential to emit:

- 10 tons per year of any one HAP;
- 25 tons per year of any combination of HAPs; or
- 100 tons per year of any other regulated air contaminant (such as VOCs).

If your potential to emit (calculated in Chapter 1.1.3) is less than 100 tons of VOCs per year, ten tons per year of any one HAP, and 25 tons per year of all HAPs combined; you are not subject to the Renewable Operating Permit program. In Chapter 1.1.3, however, we approximated a potential to emit instead of calculating the true potential to emit. Therefore, if your approximate potential to emit values are close to any of the major source thresholds, you should perform more detailed potential to emit calculations. Contact the Clean Air Assistance Program for more information.

1.2.4 Opting Out of the Title V Renewable Operating Permit Program

If your facility is a major source because it has a large potential to emit but your actual emissions are much lower, you might be able to avoid the Renewable Operating Permit program. Small companies with low emissions were not intended to be subject to this program, so there are mechanisms available to become exempt by limiting potential to emit. This process of becoming exempt is commonly referred to as “opting out.”

1.2.4.a Actual Emissions Less Than 50 Percent of Major Threshold Levels

One mechanism to opt out of the Renewable Operating Permit program involves having actual emissions less than 50 percent of the major source threshold levels. ***Michigan Rule 208a*** allows a facility to accept the 50 percent thresholds as legally enforceable limits by submitting a registration form to the AQD. The registration form must be signed by a responsible official to certify that the facility’s emissions are below all threshold levels and that these levels are accepted as legally enforceable limits on potential to emit.

The major source threshold levels are:

- 100 tons per year for VOCs;
- 10 tons per year for any single HAP; and
- 25 tons per year for all HAPs combined.

Therefore, you can use this option if your actual emissions do not exceed 50 tons per year of VOCs, five tons per year of any single HAP or 12.5 tons per year of all HAPs combined. To obtain the ***Rule 208a*** registration forms, go to www.michigan.gov/deq and click on “Air Permits,” “Renewable Operating Permits,” and then “ROP Related Forms.”

1.2.4.b Synthetic Minor Permit

If your actual emissions are greater than 50 percent of the major source thresholds but are less than the major source thresholds, you can opt out of the Renewable Operating Permit program by obtaining a synthetic minor permit. A synthetic minor permit is a Permit to Install that establishes operational and/or production limits that lower the potential to emit below the major source thresholds. These are sometimes referred to as “opt-out” permits. Facilities wishing to use this option should submit a complete Permit to Install application to the AQD.

If your potential to emit is above the major source thresholds and you cannot use any of the opt-out mechanisms, you are required to apply for a Renewable Operating Permit. Contact the Clean Air Assistance Program or the AQD for an application.

1.3 Air Quality Fees

The AQD has the authority to collect an annual air quality fee from certain businesses. Major sources and facilities subject to a **National Emission Standard for Hazardous Air Pollutants (NESHAP)** or federal **New Source Performance Standards (NSPS)** are subject to the fee program. *There is not a NESHAP or NSPS for lithographic printers, so most printers will not have to pay air quality fees.* If your facility's potential to emit is less than 100 tons per year of VOCs, ten tons per year of each individual HAP and 25 tons per year of all HAPs combined, you may not have to pay any air quality fees. Additionally, if your potential to emit exceeds the thresholds but you use an opt-out mechanism to avoid the renewable operating permit program, you are not subject to the fee program.

Any facility that must obtain a Renewable Operating Permit will have to pay an annual fee. This fee consists of two parts: a facility charge and an emission charge. The facility charge is either \$4,485 if your facility's potential to emit is greater than 100 tons per year of VOCs or \$1,795 if your facility's potential to emit exceeds the HAP emission thresholds and does not exceed 100 tons per year of VOCs. The emission charge is \$45.25 per ton of billable emissions. For example, a facility is major because it emits 14 tons per year of HAPs. It would pay a facility fee of \$1,795 and an emission charge of \$633.50 (14 tons x \$45.25/ton). Therefore the annual air quality fee would be \$2,428.50.

1.4 Reporting Air Quality Emissions

The federal **Clean Air Act** requires that an inventory of air pollution emissions for certain facilities be maintained and updated every year. The AQD maintains the annual emission inventory for stationary sources of air pollution in Michigan. The emissions information is used to:

- track air pollution trends;
- determine the effectiveness of current air pollution control programs;
- serve as a basis for future year projections of air quality;
- track source compliance;
- provide information for permit review; and
- calculate the emissions portion of the air quality fee.

The AQD updates this emission inventory by requesting facilities to complete an electronic Michigan Air Emissions Reporting System (MAERS) annual report.

Many lithographic printers do not have to complete the MAERS report. Facilities using **Rule 208a** to opt out of the Renewable Operating Permit program and facilities participating in the emission trading program, however, are required to fill out the MAERS report.

1.5 Air Emission Trading

The MDEQ is implementing a voluntary statewide air emission trading program. Improving air quality, creating market-based incentives for making emissions reductions and encouraging early emission reductions and technology innovations to reduce and quantify emissions are the major goals of the program.

Emission reduction credits are generated by reducing emissions beyond what is required to comply with an emission standard or limitation. Individual facilities will be able to use emission reduction credits to comply with technology-based emission limits.

The emission trading program also allows facilities to engage in emission averaging. Emission averaging is a reduction at one or more facilities to compensate for a contemporaneous increase at another facility or facilities.

For more information about the emission trading program, see Appendix C for contacts or go to www.michigan.gov/deq and click on “Air Emissions,” and then “Emissions Trading.”

1.6 Ozone Action!

Ozone Action! is a voluntary program of the Clean Air Coalition of Southeast Michigan and the West Michigan Clean Air Coalition. This program brings citizens, businesses, governments and environmental and health organizations together to voluntarily reduce hydrocarbon emissions on days when excessive ground-level ozone formation is likely. The actions of people, whether as part of an organization or as individuals, are very important for reducing emissions that cause ground-level ozone formation. While business and industry continue improving their pollution-control mechanisms, citizens are modifying their everyday actions to limit pollution production.

Ground-level ozone, smog, is created when sunlight reacts with volatile organic compounds such as hydrocarbon emissions from cars, buses, trucks, boats, and lawnmowers. At ground level, ozone is a health-threatening air pollutant. Reducing hydrocarbons is necessary to reduce this type of ozone formation. Ozone Action! days — those hot, windless, cloudless days — typically occur between May and September. There are typically ten to twelve Ozone Action! days in a Michigan summer.

For 20 years, portions of Michigan failed to meet federal air quality standards for ozone causing the EPA to designate some counties nonattainment areas. That nonattainment status resulted in federally mandated auto exhaust testing and extensive pollution control programs for industry. EPA has since redesignated some of these counties as attainment areas.

A voluntary reduction program can reduce emissions through the efforts of individuals and businesses. Individuals can help significantly on Ozone Action! days by doing the following:

- Refuel vehicles before or after an Ozone Action! day. If refueling is necessary, after 6 p.m. is best. Early morning refueling does not help the ozone problem.
- Do not top off that tank. Make certain gas caps are tightly sealed. If the cap is missing, replace it. Spilled gasoline evaporates into air we breathe.
- Drive smoothly, avoid “jack rabbit” starts that waste fuel and emit hydrocarbons.
- Combine trips on Ozone Action! days. A hot engine produces fewer hydrocarbon emissions than repeated cold engine starts.

- Delay lawn cutting and other maintenance activities that require gasoline-powered equipment on Ozone Action! days. A gasoline-powered lawn mower can produce as much ozone-forming hydrocarbons in one hour as several hours of driving a car. If lawn mowing must be done on an Ozone Action! day, after 6 p.m. is best.
- Avoid using charcoal lighter fluid, solvent-based paints or degreasers.
- Do not idle gasoline engines unnecessarily (usually more than 30 seconds).

Businesses can help by doing the following:

- Inform employees about the Ozone Action! effort.
- Reschedule discretionary activities wherever possible, including lawn mowing, parts cleaning and spray painting.
- Encourage carpools and public transportation on Ozone Action! days.

For more information about Ozone Action!, go to the following web sites:

- Air Quality Division, Michigan Department of Environmental Quality
www.michigan.gov/deq select “Air,” “Air Quality,” and then “Michigan Ozone Action”
- Clean Air Coalition at Southeast Michigan
www.semcog.org/ozoneaction/
- West Michigan Clean Air Coalition
www.wmcac.org

Hazardous Air Pollutants

Highlighted compounds are those commonly used in the printing industry.

75070	Acetaldehyde	94757	2,4-D, salts and esters
60355	Acetamide	3547044	DDE
75058	Acetonitrile	334883	Diazomethane
98862	Acetophenone	132649	Dibenzofurans
53963	2-Acetylaminofluorene	96128	1,2-Dibromo-3-chloropropane
107028	Acrolein	84742	Dibutylphthalate
79061	Acrylamide	106467	1,4-Dichlorobenzene(p)
79107	Acrylic acid	91941	3,3-Dichlorobenzidine
107131	Acrylonitrile	111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)
107051	Allyl chloride	542756	1,3-Dichloropropene
92671	4-Aminobiphenyl	62737	Dichlorvos
62533	Aniline	111422	Diethanolamine
90040	o-Anisidine	121697	N,N-Diethyl aniline (N,N-Dimethylaniline)
1332214	Asbestos	64675	Diethyl sulfate
		119904	3,3-Dimethoxybenzidine
		60117	Dimethyl aminoazobenzene
		119937	3,3-Dimethyl benzidine
		79447	Dimethyl carbamoyl chloride
		68122	Dimethyl formamide
		57147	1,1 Dimethyl hydrazine
		131113	Dimethyl phthalate
		77781	Dimethyl Sulfate
		534521	4,6-Dinitro-o-cresol, and salts
		51285	2,4-Dinitrophenol
		121142	2,4-Dinitrotoluene
		123911	1,4-Dioxane (1,4-Diethyleneoxide)
		122667	1,2-Diphenylhydrazine
71432	Benzene	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)
92875	Benzidine	106887	1,2-Epoxybutane
98077	Benzotrichloride	140885	Ethyl acrylate
100447	Benzyl chloride	100414 Ethyl benzene	
92524	Biphenyl	51796	Ethyl carbamate (Urethane)
117817	Bis (2-ethylhexyl) phthalate (DEHP)	75003	Ethyl chloride (Chloroethane)
542881	Bis (chloromethyl) ether	106934	Ethylene dibromide (Dibromoethane)
75252	Bromoform	107062	Ethylene dichloride (1,2-Dichloroethane)
106990	1,3-Butadiene	107211 Ethylene glycol	
		151564	Ethylene imine (Aziridine)
		75218	Ethylene oxide
		96457	Ethylene thiourea
		75343	Ethylidene dichloride (1,1-Dichloroethane)
156627	Calcium cyanamide	50000	Formaldehyde
133062	Captan		
63252	Carbaryl	76448	Heptachlor
75150	Carbon disulfide	118741	Hexachlorobenzene
56235	Carbon tetrachloride	87683	Hexachlorobutadiene
463581	Carbonyl sulfide	77474	Hexachlorocyclopentadiene
120809	Catechol	680319	Hexamethylphosphoramide
133904	Chloramben	110543 Hexane	
57749	Chlordane		
778505	Chlorine		
79118	Chloroacetic acid		
532274	2-Chloroacetophenone		
108907	Chlorobenzene		
510156	Chlorobenzilate		
67663	Chloroform		
107302	Chloromethyl methyl ether		
126998	Chloroprene		
1319773	Cresols/Cresylic acid (isomers and mixtures)		
95487	o-Cresol		
108394	m-Cresol		
106445	p-Cresol		
98828	Cumene		

302012 Hydrazine
7647010 Hydrochloric acid
7664393 Hydrogen fluoride (hydrofluoric acid)
123319 Hydroquinone

78591 Isophorone

58899 Lindane (all isomers)

108316 Maleic anhydride

67561 Methanol

72435 Methoxychlor

74839 Methyl bromide (Bromomethane)

74873 Methyl chloride (Chloromethane)

71556 Methyl chloroform (1,1,1-Trichloroethane)

78933 Methyl ethyl ketone (2-Butanone)

60344 Methyl hydrazine

74884 Methyl iodide (Iodomethane)

108101 Methyl isobutyl ketone (Hexone)

624839 Methyl isocyanate

80626 Methyl methacrylate

1634044 Methyl tert butyl ether

101144 4,4-Methylene bis (2-chloroaniline)

75092 Methylene chloride (Dichloromethane)

101688 Methylene diphenyl diisocyanate (MDI)

101779 4,4'-methylenedianiline

91203 Naphthalene

98953 Nitrobenzene

92933 4-Nitrobiphenyl

100027 4-Nitrophenol

79469 2-Nitropropane

684935 N-Nitroso-N-methylurea

62759 N-Nitrosodimethylamine

59892 N-Nitrosomorpholine

56382 Parathion

82688 Pentachloronitrobenzene (Quintobenzene)

87865 Pentachlorophenol

108952 Phenol

106503 p-Phenylenediamine

75445 Phosgene

7803512 Phosphine

7723140 Phosphorus

85449 Phthalic anhydride

1336363 Polychlorinated biphenyls (Aroclors)

1120714 1,3-Propane sultone

57578 beta-Propiolactone

123386 Propionaldehyde

114261 Propoxur (Baygon)

78875 Propylene dichloride (1,2-Dichloropropane)

75569 Propylene oxide

75558 1,2-Propylenimine (2-Methyl aziridine)

91225 Quinoline

106514 Quinone

100425 Styrene

96093 Styrene oxide

1746016 2,3,7,8- Tetrachlorodibenzo-p-dioxin

79345 1,1,2,2-Tetrachloroethane

127184 Tetrachloroethylene (Perchloroethylene)

7550450 Titanium tetrachloride

108883 Toluene

95807 2,4-Toluene diamine

584849 2,4-Toluene diisocyanate

95534 o-Toluidine

8001352 Toxaphene (chlorinated camphene)

120821 1,2,4-Trichlorobenzene

79005 1,1,2-Trichloroethane

79016 Trichloroethylene

95954 2,4,5-Trichlorophenol

88062 2,4,6-Trichlorophenol

121448 Triethylamine

1582098 Trifluralin

540841 2,2,4-Trimethylpentane

108054 Vinyl acetate

593602 Vinyl bromide

75014 Vinyl chloride

75354 Vinylidene chloride (1,1-Dichloroethylene)

1330207 Xylenes (isomers and mixtures)

95476 o-Xylenes

108383 m-Xylenes

106423 p-Xylenes

COMPOUNDS

Antimony compounds

Arsenic compounds (inorganic including arsine)

Beryllium compounds

Cadmium compounds

Chromium compounds

Cobalt compounds

Coke oven emissions

Cyanide compounds

Glycol ethers

Lead compounds

Manganese compounds

Mercury compounds

Mineral fibers

Nickel compounds

Polycyclic organic matter

Radionuclides

Selenium compounds

1.7 Where To Go For Help

SUBJECT	State and federal air quality regulations
CONTACT	DEQ, Clean Air Assistance Program
TELEPHONE	(800) 662-9278
WEB SITE	www.michigan.gov/deq (Click on “Assistance & Support Services,” “Technical Assistance”)
PUBLICATIONS	<p>Air Emissions Reporting:</p> <ol style="list-style-type: none"> 1. Michigan Air Emissions Reporting System (MAERS) Workbook <p>Permits to Install:</p> <ol style="list-style-type: none"> 1. Michigan Air Use Permit Technical Manual 2. Permit to Install: Determining Applicability Guidebook 3. Permit to Install Workbook – A Practical Guide to Completing Permit to Install <p>Renewable Operating Permits:</p> <ol style="list-style-type: none"> 1. Pass-ROP Workbook 2. Life After ROP – Renewable Operating Permit Reporting & Revisions <p>General Publications:</p> <ol style="list-style-type: none"> 1. Air Pollution Control 101 2. Michigan Air Pollution Control Laws and Rules Order Form 3. The Michigan Clean Air Consultant Directory 4. What Is an Air Contaminant/Pollutant? 5. Working with an Air Quality Consultant
SUBJECT	State and federal air quality regulations and programs
CONTACT	DEQ, Air Quality Division
TELEPHONE	(517) 373-7023
WEB SITE	www.michigan.gov/deq
SUBJECT	Federal air quality regulations
CONTACT	U.S. Environmental Protection Agency, Office of Air and Radiation
WEB SITE	www.epa.gov/oar www.epa.gov/oar/oaqps www.epa.gov/ttn
SUBJECT	Evaluation of the effectiveness of the Clean Air Assistance Program and Clean Air Ombudsman
CONTACT	Clean Air Compliance Advisory Panel
TELEPHONE	(800) 662-9278
WEB SITE	www.michigan.gov/deq
SUBJECT	Michigan Clean Air Ombudsman
CONTACT	Michigan Economic Development Corporation
TELEPHONE	(517) 373-4600
WEB SITE	www.michigan.org

MDEQ AIR QUALITY DIVISION
LITHOGRAPHIC PRINTING INDUSTRY REPORT FORMS



RULE 290 PERMIT TO INSTALL EXEMPTION: SOURCES WITH LIMITED EMISSIONS RECORD

This record is provided as a courtesy for businesses by the Michigan Department of Environmental Quality (MDEQ), Environmental Assistance Division, Clean Air Assistance Program, and is not required to be returned or submitted to the MDEQ.

Applicable Rule: Rule 290 of the Michigan Air Pollution Control Rules

NOTE:

- Rule 290 of the Michigan Air Pollution Control Rules exempts an emission unit with limited emissions from having to apply for Permit to Install. Rule 201 requires sources to obtain a Permit to Install prior to the installation, construction, reconstruction, relocation, and modification of an emission unit. Sources using this exemption must not meet any of the criteria in Rule 278 and must be able to demonstrate compliance with the various emission limits contained in Rule 290.
- Proper completion of this form is not the sole method of demonstrating compliance with the requirements of Rule 290. For example, an alternative method of demonstrating compliance could be determining the emissions of air contaminants from a single unit of production and recording the number of production units generated per month.
- An emission unit that emits an air contaminant, excluding noncarcinogenic Volatile Organic Compounds (VOCs) and noncarcinogenic, non-ozone forming materials listed in Rule 122(f), which has an Initial Threshold Screening Level (ITSL) or Initial Risk Screening Level (IRSL) less than 0.04 micrograms per cubic meter (ug/m³) cannot use Rule 290.
- Perchloroethylene is the only non-ozone forming material listed in Rule 122(f) that is a carcinogen. Two of the stabilizers in Rule 122(f) Table 11, tertiary butyl alcohol and 1,2-butylene oxide, are carcinogenic and are ozone forming materials.
- If an emission unit is equipped with a control device (i.e., equipment that captures and/or destroys air contaminants) and the control device is not vital to production of the normal product of the process or to its normal operation, then there are two options of recording emissions in Sections 2, 3, and 4:
 1. record all uncontrolled emissions of air contaminants (i.e., all air contaminants entering the control device); or
 2. record all controlled emissions of air contaminants (all air contaminants leaving the control device).Whatever option is chosen, make sure that option is used consistently throughout Sections 2, 3, 4, and 5.
- If the emission unit is not equipped with a control device or the control device is vital to production of the normal product of the process or to its normal operation, then the quantity of each emission of air contaminant identified in Sections 2, 3, 4, and 5 should be recorded as uncontrolled emissions.
- Monthly emission records need to be maintained on file for the most recent two-year period and made available to the MDEQ, Air Quality Division upon request. (ROP subject sources must keep records for five years)

Please print or type all information.

1. COMPLETE FOR EACH EMISSION UNIT USING THE EXEMPTION IN RULE 290.
SOURCE NAME:
MONTH/YEAR:
DESCRIPTION OF EMISSION UNIT (including control devices):

RULE 290 PERMIT TO INSTALL EXEMPTION: SOURCES WITH LIMITED EMISSIONS RECORD (continued)

2. RECORD EMISSIONS OF NONCARCINOGENIC AIR CONTAMINANTS (EXCLUDING NONCARCINOGENIC VOCS AND NONCARCINOGENIC, NON-OZONE FORMING MATERIALS LISTED IN RULE 122(f)) (see Appendix A)			
ITSL 2.0 ug/m3*			
CAS #	Chemical Name	Uncontrolled Emissions (lbs/month)	Controlled Emissions (lbs/month)
Monthly Total		①	②
2.0 ug/m3 ITSL 0.04 ug/m3			
CAS #	Chemical Name	Uncontrolled Emissions (lbs/month)	Controlled Emissions (lbs/month)
Monthly Total		③	④
Compliance Criteria: The total in Box ① must be 1,000 pounds or the total in Box ② must be 500 pounds. The total in Box ③ must be 20 pounds or the total in Box ④ must be 10 pounds. *The emissions of noncarcinogenic particulate air contaminants with an ITSL 2.0 ug/m3 do not have to be recorded in this table as long as the requirements in Section 6 are being complied with.			

3. RECORD EMISSIONS OF CARCINOGENIC AIR CONTAMINANTS			
IRSL 0.04 ug/m3			
CAS #	Chemical Name	Uncontrolled Emissions (lbs/month)	Controlled Emissions (lbs/month)
Monthly Total		⑤	⑥
Compliance Criteria: The total in Box ⑤ must be 20 pounds or the total in Box ⑥ must be 10 pounds.			

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, ENVIRONMENTAL SCIENCE AND SERVICES DIVISION
RULE 290 PERMIT TO INSTALL EXEMPTION: SOURCES WITH LIMITED EMISSIONS RECORD (continued)

4. RECORD EMISSIONS OF ALL NONCARCINOGENIC VOCS AND NONCARCINOGENIC, NON-OZONE FORMING MATERIALS LISTED IN RULE 122(f) (see Appendix A)			
CAS #	Chemical Name	Uncontrolled Emissions (lbs/month)	Controlled Emissions (lbs/month)
Monthly Total		⑦	⑧
Compliance Criteria: The total in Box ⑦ must be 1,000 pounds or the total in Box ⑧ must be 500 pounds.			

5. RECORD TOTAL MONTHLY EMISSIONS	
	lbs/month
Total uncontrolled emissions (Box ① + Box ③ + Box ⑤ + Box ⑦)	
Total controlled emissions (Box ② + Box ④ + Box ⑥ + Box ⑧)	
Compliance Criteria: The total uncontrolled emissions (Box ① + Box ③ + Box ⑤ + Box ⑦) must be 1,000 pounds or The total controlled emissions (Box ② + Box ④ + Box ⑥ + Box ⑧) must be 500 pounds.	

6. NONCARCINOGENIC PARTICULATE AIR CONTAMINANTS
<p>The emission unit may emit noncarcinogenic particulate air contaminants provided that the following requirements are complied with:</p> <p>The particulate emissions are controlled by an appropriately designed and operated fabric filter collector or an equivalent control system which is designed to control particulate matter to a concentration of less than or equal to 0.01 pounds of particulate per 1,000 pounds of exhaust gases and which do not have an exhaust gas flow rate of more than 30,000 actual cubic feet per minute.</p> <p>The visible emissions from the emission unit are not more than 5% opacity in accordance with the methods contained in Rule 303.</p> <p>The Initial Threshold Screening Level (ITSL) for each particulate air contaminant, excluding nuisance particulate, is more than 2.0 micrograms per cubic meter.</p> <p>NOTE: Quantities of particulates being emitted from an emission unit complying with the requirements above should not be included in Section 2. Quantities of noncarcinogenic particulates with an ITSL equal to or less than 2.0 ug/m3 and greater than or equal to 0.04 ug/m3 must be included in Section 2. Quantities of carcinogenic particulates must be included in Section 3.</p>

7. OTHER REQUIREMENTS
<p>Attach emission calculations to demonstrate compliance with the emission limits identified in Sections 2, 3, 4, 5, and 6.</p> <p>Keep this record on file for 2 years.</p>

RULE 290 PERMIT TO INSTALL EXEMPTION: SOURCES WITH LIMITED EMISSIONS RECORD (continued)

APPENDIX A

R 336.1122 Definitions; V.

Rule 122. As used in these rules:

(f) "**Volatile organic compound**" means any compound of carbon or mixture of compounds of carbon that participates in photochemical reactions, excluding the following materials, all of which do not contribute appreciably to the formation of ozone:

- (i) Carbon monoxide.
- (ii) Carbon dioxide.
- (iii) Carbonic acid.
- (iv) Metallic carbides or carbonates.
- (v) Boron carbide.
- (vi) Silicon carbide.
- (vii) Ammonium carbonate.
- (viii) Ammonium bicarbonate.
- (ix) Methane.
- (x) Ethane.

(xi) The methyl chloroform portion of commercial grades of methyl chloroform, if all of the following provisions are complied with:

- (A) The commercial grade of methyl chloroform is used only in a surface coating or coating line that is subject to the requirements of part 6 or 7 of these rules.
- (B) The commercial grade of methyl chloroform contains no stabilizers other than those listed in table 11.
- (C) Compliance with the applicable limits specified in part 6 or 7 of these rules is otherwise not technically or economically reasonable.
- (D) All measures to reduce the levels of all organic solvents, including the commercial grade of methyl chloroform, from the surface coating or coating line to the lowest reasonable level will be implemented.
- (E) The emissions of the commercial grade of methyl chloroform do not result in a maximum ambient air concentration exceeding any of the allowable ambient air concentrations listed in table 11.
- (F) The use of the commercial grade of methyl chloroform is specifically identified and allowed by a permit to install, permit to operate, or order of the department.
- (G) Table 11 reads as follows:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, ENVIRONMENTAL SCIENCE AND SERVICES DIVISION
RULE 290 PERMIT TO INSTALL EXEMPTION: SOURCES WITH LIMITED EMISSIONS RECORD (continued)

TABLE 11

Commercial grade of methyl chloroform --
allowable ambient air concentrations

Compound	ppm ¹	Time ²
Methyl chloroform	3.5	1 hour
Tertiary butyl alcohol ³	1.0	1 hour
Secondary butyl alcohol ³	1.0	1 hour
Methylal ³	10.0	1 hour
1,2-butylene oxide ³	0.028 and 0.00041	1 hour annual

(xii) The methyl chloroform portion of commercial grades of methyl chloroform that contain any other stabilizer not listed in table 11 of this rule, if all of the following provisions are complied with:

(A) The commercial grade of methyl chloroform is used only in a surface coating or coating line that is subject to the requirements of part 6 or 7 of these rules.

(B) Compliance with the applicable limits specified in part 6 or 7 of these rules is otherwise not technically or economically reasonable.

(C) All measures to reduce the levels of all organic solvents, including the commercial grade of methyl chloroform, from the surface coating or coating line to the lowest reasonable level will be implemented.

(D) The emissions of any compound in the commercial grade of methyl chloroform that is listed in table 11 of this rule do not result in a maximum ambient air concentration exceeding any of the allowable ambient air concentrations listed in table 11.

(E) The emission of all compounds in the commercial grade of methyl chloroform that are not listed in table 11 is demonstrated to comply with R 336.1901.

(F) The use of the commercial grade of methyl chloroform is specifically identified and allowed by a permit to install, permit to operate, or order of the department.

(xiii) Acetone.

(xiv) Cyclic, branched, or linear completely methylated siloxanes.

(xv) Parachlorobenzotrifluoride.

(xvi) Perchloroethylene.

(xvii) Trichlorofluoromethane (CFC-11).

(xviii) Dichlorodifluoromethane (CFC-12).

(xix) 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113).

(xx) 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114).

(xxi) Chloropentafluoroethane (CFC-115).

(xxii) 1,1-dichloro 1-fluoroethane (HCFC-141b).

(xxiii) 1,1-chloro 1,1-difluoroethane (HCFC-142b).

(xxiv) Chlorodifluoromethane (HCFC-22).

(xxv) 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123).

(xxvi) 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124).

-
1. Parts per million, by volume
 2. Averaging time period
 3. This compound is a stabilizer

RULE 290 PERMIT TO INSTALL EXEMPTION: SOURCES WITH LIMITED EMISSIONS RECORD (continued)

- (xxvii) Trifluoromethane (HFC-23).
- (xxviii) Pentafluoroethane (HFC-125).
- (xxix) 1,1,2,2-tetrafluoroethane (HFC-134).
- (xxx) 1,1,1,2-tetrafluoroethane (HFC-134a).
- (xxxi) 1,1,1-trifluoroethane (HFC-143a).
- (xxxii) 1,1-difluoroethane (HFC-152a).
- (xxxiii) 3,3-dichloro-1, 1,1,2,2-pentafluoropropane (HCFC-225ca).
- (xxxiv) 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb).
- (xxxv) 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee).
- (xxxvi) Difluoromethane (HFC-32).
- (xxxvii) Ethyl fluoride (HFC-161).
- (xxxviii) 1,1,1,3,3,3-hexafluoropropane (HFC-236fa).
- (xxxix) 1,1,2,2,3-pentafluoropropane (HFC-245ca).
- (xl) 1,1,2,3,3- pentafluoropropane (HFC-245ea).
- (xli) 1,1,1,2,3- pentafluoropropane (HFC-245eb).
- (xlii) 1,1,1,3,3- pentafluoropropane (HFC-245fa).
- (xlili) 1,1,1,2,3,3-hexafluoropropane (HFC-236ea).
- (xliv) 1,1,1,3,3-pentafluorobutane (HFC365mfc).
- (xlv) Chlorofluoromethane (HCFC-31).
- (xlii) 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a).
- (xlvii) 1-chlor-1-fluoroethane (HCFC-151a).
- (xlviii) 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxybutane.
- (xlix) 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane.
- (l) 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane.
- (li) 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane.
- (lii) Methyl acetate.
- (liii) Perfluorocarbon compounds that fall into the following classes:
 - (A) Cyclic, branched, or linear, completely fluorinated alkanes.
 - (B) Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations.
 - (C) Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations.
 - (D) Sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.
- (liv) Ingredient compounds in materials other than surface coatings that have a vapor pressure less than or equal to 0.1 millimeters of mercury at the temperature at which they are used.

The methods described in R 336.2004 and R 336.2040 shall be used for measuring volatile organic compounds for purposes of determining compliance with emission limits, unless the methods do not result in accurate or reliable results. In this case, other methods and procedures acceptable to the department may be used.

History: 1979 ACS 1, Eff. Jan. 19, 1980; 1985 MR 2, Eff. Feb. 22, 1985; 1988 MR 5, Eff. May 20, 1988; 1989 MR 4, Eff. Apr. 19, 1989; 1993 MR 4, Eff. Apr. 28, 1993; 1997 MR 5, Eff. June 15, 1997; 2000 MR 18, Eff. November 30, 2000.

EXAMPLE



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, ENVIRONMENTAL SCIENCE AND SERVICES DIVISION

PERMIT TO INSTALL EXEMPTION RECORD FOR LITHOGRAPHIC PRINTERS

This record is provided as a courtesy for printers by the Michigan Department of Environmental Quality (MDEQ), Environmental Science and Services Division, Clean Air Assistance Program, and is not required to be returned or submitted to the MDEQ.

Applicable Rule: Rule 290 of the Michigan Air Pollution Control Rules

NOTE: This record can only be used if all air emissions are noncarcinogenic VOCs.

Please print or type all information.

1. INSTRUCTIONS AND ASSUMPTIONS These calculations are based on the following assumptions from the USEPA Control Techniques Guidelines for Offset Lithographic Printing: <div style="display: flex;"> <div style="flex: 1;">Inks:</div> <div> Heatset web ink = 40% VOC Nonheatset web ink = 30% VOC Nonheatset sheet ink = 25% VOC Web press ink usage = 10.3 lb/hr (heatset and nonheatset) Sheet press ink usage = 0.25 lb/hr Ink density = 8.33 lb/gal </div> </div>	
Fountain solutions:	Dampening aid usage: Heatset web = 0.90 lb IPA/lb ink Nonheatset web = 0.53 lb IPA/lb ink Nonheatset sheet = 1.25 lb IPA/lb ink 1 lb non-IPA VOC concentrate = 10 lb IPA Baseline non-IPA VOC in concentrate = 10% (0.84 lb VOC/gal concentrate)
Cleaning solutions:	Usage (all presses) = 0.33 lb/hr Baseline VOC content = 100% Fill out this record each month. If the calculations result in less than 1,000 pounds per month emission, the press is exempt from obtaining a Permit to Install as required by Rule 201 of the Michigan Air Pollution Control Rules. These calculations are only a guide to determine exemptions. If your emissions are close to the 1,000 pounds per month level, more detailed calculations should be performed using source specific information.

2. MONTHLY VOC EMISSION CALCULATION TABLE (complete 1 row for each printing press):					
Month/Year _____					
	A	B	C	D	E
Press Description	Press Width (in)	Number of Blankets	Monthly Operating Hours (hr/month)	Multiplying Factor Nonheatset sheet: 0.0088 Nonheatset web: 0.0142 Heatset web: 0.0979	Emissions (lb/month) [A x B x C x D] (Must be 1,000)
Press 1 – nonheatset	40	4	184	0.0088	259
Sheet					
Press 2 - nonheatset	40	1	184	0.0088	65
Sheet					
Press 3 – nonheatset	17.5	4	184	0.0142	183
Web					

EXAMPLE



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, ENVIRONMENTAL SCIENCE AND SERVICES DIVISION

HAP EMISSION CALCULATION SHEET FOR LITHOGRAPHIC PRINTERS

This sheet is provided as a courtesy for printers by the Michigan Department of Environmental Quality (MDEQ), Environmental Science and Services Division, Clean Air Assistance Program, and is not required to be returned or submitted to the MDEQ.

Please print or type all information.

1. HAP EMISSION CALCULATION TABLE (complete 1 table for each HAP):				
HAP: <u>Glycol Ether</u>				
	A	B	C	D
Material	Usage (gal/yr)	HAP Content (% HAP/100)	Density (lb/gal) [or specific gravity x 8.34 lb/gal]	Actual Emissions (ton/yr) [A x B x C x 0.0005 ton/lb]
Alcohol replacement	40	0.90	7.56	0.14
Fountain solution	200	0.03	9.16	0.03
			Total	0.17①
APPROXIMATE POTENTIAL TO EMIT (ton/yr): Multiply the Actual Emissions ① by 8760, then divide by the actual operating hours. 0.72				
(1a)				

2. HAP EMISSION CALCULATION TABLE (complete 1 table for each HAP):				
HAP: <u>Xylene</u>				
	A	B	C	D
Material	Usage (gal/yr)	HAP Content (% HAP/100)	Density (lb/gal) [or specific gravity x 8.34 lb/gal]	Actual Emissions (ton/yr) [A x B x C x 0.0005 ton/lb]
Blanket wash solvent	500	0.016	6.67	0.03
			Total	0.03②
APPROXIMATE POTENTIAL TO EMIT (ton/yr): Multiply the Actual Emissions ② by 8760, then divide by the actual operating hours. 0.13				
(2a)				

3. TOTAL HAP EMISSIONS (ton/yr): Add the Emissions for each HAP (Boxes ① + ②, etc.). 0.20
--

4. TOTAL HAP POTENTIAL TO EMIT (ton/yr): Add the Potential to Emit for each HAP (Boxes (1a) + (2a) etc.). 0.85

EXAMPLE



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, ENVIRONMENTAL SCIENCE AND SERVICES DIVISION

VOC EMISSION CALCULATION SHEET FOR LITHOGRAPHIC PRINTERS

This sheet is provided as a courtesy for printers by the Michigan Department of Environmental Quality (MDEQ), Environmental Science and Services Division, Clean Air Assistance Program, and is not required to be returned or submitted to the MDEQ.

Please print or type all information.

1. INK VOC EMISSION CALCULATION TABLE (complete 1 row for each ink):				
	A	B	C=(1-RF)	D
Ink	Usage (lb/yr)	VOC Content (lb VOC/lb ink or % VOC/100)	RF=Retention Factor [Heatset inks: RF=0.20 Nonheatset inks: RF=0.95]	Actual Emissions (ton/yr) [A x B x C x 0.0005 ton/lb]
Brand A (nonheatset)	1800	0.20	0.05	0.01
Brand B (nonheatset)	6000	0.20	0.05	0.03
Total				0.04①

2. FOUNTAIN SOLUTIONS, CLEANING SOLVENTS, AND OTHER MATERIALS VOC EMISSION CALCULATION TABLE (complete 1 row for each material):			
	E	F	G
Material	Usage (gal/yr)	VOC Content [lb VOC/gal or density (lb/gal) x wt % VOC/100]	Actual Emissions (ton/yr) [E x F x 0.0005 ton/lb]
Blanket wash solvent	500	6.74	1.69
Isopropyl alcohol (IPA)	300	6.54	0.98
Alcohol replacement	40	7.14	0.14
Fountain concentrate	200	0.88	0.09
Total			2.90②

3. TOTAL VOC EMISSIONS (ton/yr): Add the Emissions from Boxes ① and ② 2.94③
--

4. ACTUAL OPERATING HOURS (hr/yr): List hours of operation 2080④

5. APPROXIMATE VOC POTENTIAL TO EMIT (ton/yr): Multiply the total VOC Emissions ③ by 8760, then divide by the Actual Operating Hours ④. 12.38
--